WHAT IS CLAIMED IS:

1. A method for dicing a wafer having a base material with a diamond structure comprising:

polishing a predetermined portion of the wafer from its back side; and

dicing the wafer through at least one line along a direction at a predetermined offset angle from a natural cleavage direction of the diamond structure.

2. The method of claim 1 wherein a thickness of the wafer after polishing is smaller than 35 mil.

3. The method of claim 1 wherein a thickness of the wafer after polishing is smaller than 25 mil.

4. The method of claim 1 wherein the offset angle is an angle between 30 and 60 degree.

5. The method of claim 4 wherein the offset angle is about 45 degree.

6. The method of claim 1 wherein the base material is silicon based material.

7. The method of claim 1 wherein the base material is GaAs.

8. The method of claim 1 wherein the base material is SiGe.

9. The method of claim 1 wherein the dicing further includes:

conducting a first dicing to form a first dicing recess on the wafer; and

conducting a second dicing within the first dicing recess to form a second dicing recess at a width narrower than that of the first dicing recess.

10. The method of claim 1 wherein the dicing further includes inserting a dicing tool onto the wafer at a predetermined angle with reference to a surface of the wafer.

11. The method of claim 10 wherein the predetermined angle is less than 77 degree.

12. The method of claim 10 wherein the predetermined angle is less than 56 degree.

13. The method of claim 10 wherein the predetermined angle is less than 48 degree.

14. The method of claim 10 wherein the predetermined angle is less than 37 degree.

15. The method of claim 10 wherein the predetermined angle is mathematically determined by ArcCos[(n^2) / sqrt$(n^2 + k^2 + l^2)$], where n, k and l are integers and in the range of 0<= (n, k, l) <= 4.

16. The method of claim 10 wherein the predetermined angle is mathematically determined by ArcCos[(k^2) / sqrt$(n^2 + k^2 + l^2)$], where n, k and l are integers and in the range of 0<= (n, k, l) <= 4.

17. The method of claim 10 wherein the predetermined angle is mathematically determined by ArcCos[(l^2) / sqrt$(n^2 + k^2 + l^2)$], where n, k and l are integers and in the range of 0<= (n, k, l) <= 4.

18. The method of claim 1 wherein the dicing further includes using a fluid beam for dicing the wafer.

19. The method of claim 18 wherein the fluid beam is a water jet.

20. The method of claim 19 wherein the water jet has a predetermined surface energy enough for maintaining the beam in order for dicing the wafer.

21. The method of claim 1 wherein the dicing further includes using a laser beam for dicing the wafer.

22. The method of claim 1 wherein the dicing further includes forming one or more recesses along the dicing line.

23. The method of claim 22 wherein the recess areas are connected to form one or more recess grooves.

24. The method of claim 22 wherein the recesses are at a level below a die formed on the wafer.

25. The method of claim 22 wherein the recesses are substantially leveled with a top surface of a die formed on the wafer.

26. The method of claim 25 wherein the recesses are filled with one or more organic materials for absorbing stress caused during the dicing.

27. The method of claim 1 wherein the wafer is a {110} wafer and the natural cleavage direction is the <100> direction.

28. The method of claim 1 wherein the wafer is a {100} wafer and the natural cleavage direction is the <110> direction.

29. A method for dicing a wafer having a base material with a diamond structure, the method comprising:

forming one or more dies with at least one edge thereof at an offset angle from a natural cleavage direction of the diamond structure with one or more protection elements along at least one dicing line; and

dicing the wafer along the dicing line,

wherein the protection elements protect the dies from undesired cracking while the wafer is being diced along the dicing line.

30. The method of claim 29 wherein the protection elements are metal based elements formed on the wafer.

31. The method of claim 29 wherein the protection elements are dielectric elements formed on the wafer.

32. The method of claim 29 wherein the protection elements are one or more recesses formed into the wafer.

33. The method of claim 32 wherein the recesses are at a level below a die formed on the wafer.

34. The method of claim 32 wherein the recesses are substantially leveled with a top surface of a die formed on the wafer.

35. The method of claim 32 wherein the recesses are filled with one or more organic materials for absorbing stress caused during the dicing.

36. The method of claim 29 wherein the die further includes one or more protection elements at one or more predetermined locations on its periphery.

37. The method of claim 33 wherein the protection elements on the periphery are unconnected from a core circuitry of the die.

38. The method of claim 29 wherein the wafer is a {110} wafer and the natural cleavage direction is the <100> direction.

39. The method of claim 29 wherein the wafer is a {100} wafer and the natural cleavage direction is the <110> direction.

40. A wafer comprising:

one or more dies formed thereon with at least one of its edges at an offset angel from a natural cleavage direction of a diamond structure of a base material forming the wafer; and

at least one dicing line having one or more protection elements for protecting the dies from undesired cracking while the wafer is being diced along the dicing line.

41. The wafer of claim 40 wherein the dies are formed on two sides of the dicing line.

42. The wafer of claim 40 wherein the protection elements are metal elements formed on the wafer.

43. The wafer of claim 40 wherein the protection elements are dielectric

elements formed on the wafer.

44. The wafer of claim 40 wherein the protection elements are one or more recesses formed into the wafer.

45. The wafer of claim 44 wherein the recesses are at a level below a die formed on the wafer.

46. The wafer of claim 44 wherein the recesses are substantially leveled with a top surface of a die formed on the wafer.

47. The wafer of claim 46 wherein the recesses are filled with one or more organic materials for absorbing stress caused during the dicing.

48. The wafer of claim 40 wherein the die further includes one or more protection elements at one or more predetermined locations on its periphery.

49. The wafer of claim 48 wherein the protection elements on the periphery are unconnected from a core circuitry of the die.

50. The wafer of claim 40 wherein the wafer is a {110} wafer and the natural cleavage direction is the <100> direction.

51. The wafer of claim 40 wherein the wafer is a {100} wafer and the natural cleavage direction is the <110> direction.

52. The wafer of claim 40 wherein the die further includes one or more protection elements at one or more locations on its periphery.

53. The wafer of claim 52 wherein the protection elements on the periphery is unconnected from a core circuitry of the die.